Before the
FEDERAL COMMUNICATIONS COMMISSION

In the Matter of	
Reliability and Continuity of Communications Networks, Including Broadband Technologies	PS Docket No. 11-60
Effects on Broadband Communications Networks of Damage or Failure of Network Equipment or Severe Overload	PS Docket No. 10-92
Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks	EB Docket No. 06-119

To: The Commission

COMMENTS OF NEXTG NETWORKS, INC.

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NextG Networks, Inc., on behalf of its operating subsidiaries, NextG Networks of NY, Inc., NextG Networks of California, Inc., NextG Networks Atlantic, Inc., and NextG Networks of Illinois, Inc., (collectively "NextG"), submits these comments in response to the Commission's Notice Of Inquiry ("NOI") in the above-captioned proceedings.[1]

I. INTRODUCTION AND SUMMARY

NextG appreciates this opportunity to assist the Commission in its inquiry into the reliability and continuity of communications networks and recognizes that the reliability of the nation's communications networks is an important issue. However, NextG submits these comments to emphasize to the Commission that not all communications networks are the same, and thus a one-size-fits-all approach to issues such as backup power would not be appropriate. Indeed, NextG demonstrates below that, regardless of the potential merits of backup power rules for other communications networks, practical, technical, and economic factors dictate that no backup power rule be imposed on distributed antenna system ("DAS") Nodes.

As the Commission has recognized, DAS networks are an important tool for advancing the deployment of broadband and telecommunications services. However, while NextG has installed some short-term backup power for a limited number of its Nodes, the imposition of any rule that requires deployment of backup power at each DAS network Node would threaten the viability of DAS networks. NextG's DAS networks include wireless transmitters on street light and utility poles throughout neighborhoods and areas that may be harder to reach from traditional high-site antenna towers. While the benefits of deploying these DAS networks are enormous to increasing the capacity, coverage, and robustness of wireless networks, as a general rule, DAS Nodes cannot accommodate backup power equipment for several reasons. First, the nature of

[1] *In the matter of Reliability and Continuity of Communications Networks, Including Broadband Technologies*, Notice of Inquiry, FCC 11-55 (Rel. Apr. 7, 2011) ("NOI").

DAS facilities requires the deployment of hundreds or even thousands of small antennas instead of just a few high-site antennas on towers, meaning the cost of deploying backup power supplies for every DAS Node would be substantial if not prohibitive. Second, in many cases there is inadequate capacity on utility and/or street light poles, or the surrounding ground area, to support the equipment needed to provide even short periods of backup power. Third, even if possible from an engineering standpoint, many other rules and regulations, such as local right-of-way and zoning codes, as well as environmental and hazardous materials regulations, would make it difficult or in some cases impossible for NextG to obtain approval to place its Nodes if NextG were also required to place backup power equipment at every site. Thus, NextG encourages the Commission to recognize that no matter what conclusions it may draw regarding backup power for communications networks, generally, the application of a backup power rule to DAS Nodes would be inappropriate.

II. BACKGROUND

A. DAS Technology And Its Beneficial Uses

NextG is at the cutting edge of the provision of telecommunications services using advanced technologies and capabilities. At the most general level, NextG provides telecommunications services to wireless providers that enable those entities to provide the next generation in wireless voice and broadband services. NextG provides its service, generally, via distributed antenna systems ("DAS"), which involve a network architecture that uses fiber-optic cable and small antennas mounted in the public rights-of-way ("ROW"), on infrastructure such as lamp posts and utility poles, to provide telecommunications services to wireless providers.[2] NextG's fiber-based telecommunications service allows its wireless provider customers the

[2] Not all of NextG's telecommunications services are provided via DAS networks. NextG also provides some fiber-to-the-tower backhaul services that do not use a "DAS" network.

ability to increase coverage, capacity, and bandwidth. NextG's telecommunications service and network are currently utilized by both CMRS providers, and, to a lesser extent, wireless Internet Service Providers ("WISPs"). Thus, NextG's experience and the architecture and services deployed by NextG are simultaneously at both the core and the cutting edge of the wireless industry.

The architecture of NextG's DAS facilities consists of fiber optic lines leading to and connecting various equipment and antennas at remote locations called "Nodes," with a central "hub," typically located in a building on private property. In order to construct its DAS networks, NextG must have access to poles in the public rights-of-way (utility poles, streetlight poles, or traffic signal poles). NextG installs its fiber optic lines either underground, in conduits, or aerially on poles. However, it must install its Node equipment (antennae and related equipment boxes) on poles. NextG uses either poles owned by the local utility company or poles owned by the municipality, or a combination of both. In some situations, NextG may even install its own pole in an existing utility corridor.

As wireless providers seek to deploy the next generation of wireless services, including broadband, AWS, and 700 MHz, one of the central obstacles they face is the technical and practical limitations of traditional "high site" antenna towers and local management of their placement. Traditional towers and rooftops may be good solutions for providing low capacity, wide area coverage (assuming the sites can be built or acquired where they are needed). As demand for capacity on the network grows, however, more and more sites must be added to the network so that the spectrum frequencies that a particular operator is licensed for can be re-used

for efficient use of spectrum.[3] Deployment of new sites is by no means an easy matter. Resistant local authorities and the cost and availability of locations, among other things, are significant impediments to the prompt roll out of new sites.

One of the most effective ways to add sites is through the use of low site antennas. The low antenna sites facilitate a greater re-use of the wireless spectrum since low-height antennas can be more easily isolated from each other, thus resulting in a much higher capacity and quality network that cannot be delivered by a network consisting entirely of high-site antennas. In addition to capacity benefits, a network of low sites in an urban area can provide coverage in many uncovered areas, or so-called "dead spots," that would be "shadowed" under the traditional antenna locations or where zoning and planning laws simply prohibit the installation of high-site facilities. Higher capacity and greater coverage in turn are the necessary building blocks for continued deployment of wireless services.

NextG has developed a telecommunications service offering based entirely on low sites. Specifically, NextG uses fiber-optic cable and small antennas mounted in the public right-of-way, on infrastructure such as lamp posts and utility poles. Using this fiber network and right-of-way infrastructure, NextG has effectively "split" a traditional cell site, keeping only the necessary pieces in the remote antenna location, and allowing the rest of the equipment to be placed in a centralized facility. NextG believes that this method of splitting and sharing is a vital and important engineering advance that economizes and maximizes spectrum use. More efficient use of spectrum means that higher bandwidth services can be delivered, build-out of

[3] Capacity in a cellular network comes, in general, from reusing spectrum. The greater the number of radiating elements, the more often spectrum can be reused and the more capacity the network will have. Of course, this general statement varies somewhat depending on the type of technology used, *i.e.*, variants of TDMA or CDMA gain capacity and system performance in different ways. NextG's wireless solution is "protocol agnostic" and can accommodate all forms of wireless technologies.

existing spectrum allocations is significantly increased for greater coverage, and wireless network capacity is increased resulting in fewer dropped calls. This is the wireless spectrum-maximizing technology of DAS facilities.

The Commission has recognized the importance of DAS in achieving the Commission's broadband deployment goals and policies. For example, in the Commission's Technical Advisory Council's April 22, 2011, Report, the Technical Advisory Council recommended that the Commission take steps to promote deployment of DAS networks based on their beneficial role in the deployment of wireless broadband.[4] Likewise, Chairman Genachowski noted the role of DAS in his Statement on the Commission's April 7, 2011 Pole Attachment Report and Order.[5]

B. How NextG's DAS Networks Are Powered

The power configuration supporting NextG's DAS facilities generally provides for commercial power to be delivered to Nodes primarily in one of three ways. In the case of utility poles, NextG generally obtains commercial power from a secondary drop. In the case of streetlights, NextG generally connects power directly to the commercial power or through a metered power source. Finally, in some cases, NextG installs a low DC voltage feed to a Node from a remote supply power distribution point, which is effective for distances up to approximately one mile.

NextG's Nodes supporting wireless antennas are connected to a NextG hub from which telecommunications traffic is routed to the PSTN or out to other nodes. The NextG hub is either powered from a carrier-customer's power plant, or NextG installs its own commercial power service. If a Node loses power, the NextG network operations center will receive notification of the power outage and NextG will immediately contact its carrier customer and open a trouble

[4] *Technical Advisory Council Chairman's Report*, 2011 FCC LEXIS 1574 (rel. Apr. 22, 2011).
[5] *In the matter of Implementation of Section 224 of the Act; A National Broadband Plan for Our Future*, FCC 11-50, Statement of Chairman Julius Genachowski (April 7, 2011).

ticket. A limited amount of backup power is currently used by NextG. The vast majority of NextG's Node sites do not currently have any form of battery back up. At the hubs, the majority of NextG's hub racks are powered with DC power from the carrier-customer's power plant, which at a minimum has battery back up and in many cases has generator back up. In a few systems, NextG runs its hub racks from AC power, but NextG uses commercial UPC units to provide back up for the host racks.

III. THE UNIQUE CHARACTERISTICS OF DAS MAKE UNIVERSAL BACKUP POWER IMPRACTICABLE

In the NOI, the Commission asks a series of questions about backup power, fundamentally asking "[i]s there a need for specific backup power requirements?"[6] Recognizing that the answer to that question may not be universally applicable, the Commission also asks "[i]f the Commission were to find there is a need for specific backup power requirements, should they be uniform for all communications service providers or should there be different levels of backup for different services based upon other factors?"[7] NextG submits that regardless of whether the Commission finds that backup power requirements may be required for some providers or services, the Commission should not impose any backup power requirement on DAS networks.[8]

As explained by NextG in the *Katrina Panel* proceeding and appeal, physical, practical, and economic features of DAS networks make universal deployment of backup power for DAS

[6] NOI ¶ 23.
[7] NOI ¶ 23.
[8] For purposes of discussion, NextG treats the Commission as having authority to impose such rules. However, NextG does not concede that the Commission does have authority to impose backup power requirements and reserves its rights on that issue should the Commission proceed with a Notice of Proposed Rulemaking or other action.

Nodes impossible.[9] While the benefits of deploying NextG's DAS networks are enormous to increasing the capacity, coverage, and robustness of wireless networks, DAS Nodes cannot accommodate mandatory backup power requirements for several reasons. First, the nature of DAS facilities requires the deployment of hundreds or even thousands of small antennas instead of just a few high-site antennas on towers, meaning the cost of universally deploying backup power for DAS would be substantial if not prohibitive. Second, there is likely inadequate capacity on utility and/or street light poles, or the surrounding ground area, to support the equipment needed to provide back up power in all cases. Third, even if it were technically possible, many other rules and regulations, such as local right-of-way and zoning codes, as well as environmental and hazardous materials regulations, would make it difficult or impossible for NextG to obtain approval to place its Nodes if NextG were also required to place backup power equipment at every site. Thus, the application of any mandatory backup power rule to DAS facilities may effectively end DAS deployments and deprive the public of technology with the potential to greatly improve wireless capacity and coverage.

A. Pole Attachment Issues

The deployment of backup power units would face significant resistance from utility pole owners who will seek to prohibit the installation of equipment boxes of the size and weight necessary to accommodate any meaningful backup power. For each Node on NextG's networks, it must install associated equipment. Those equipment boxes are typically very small, particularly in comparison to the cabinets necessary to satisfy a backup power rule. For example, in some of its systems, NextG is deploying equipment boxes that are only

[9] NextG filed a Petition For Reconsideration of the Commission's initial backup power rules adopted in the *Katrina Panel* proceeding. *Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks*, EB Docket No. 96-119, Petition For Reconsideration of NextG Networks, Inc. (filed Aug. 10, 2007). NextG also intervened in the appeal of the Commission's *Katrina Panel* rules before the DC Circuit.

approximately 24 inches tall, 6 inches wide, and 6 inches deep. Nonetheless, NextG frequently encounters resistance from utility pole owners regarding the attachment of even such small boxes. Indeed, some utility companies purport to prohibit the attachment of any equipment boxes of any kind to their poles.[10] NextG can realistically expect to face significant opposition from pole owners to the attachment of backup power equipment of the size needed to satisfy even a minimal backup power requirement. Indeed, depending on the backup power requirement, there may be legitimate engineering concerns regarding the attachment of equipment of such size and weight to existing poles. For example, for the Commission's eight hour backup power requirement in the *Katrina* proceeding, NextG estimated that the equipment would weigh approximately 350 pounds and be over four and a half feet tall.[11] Many poles may be structurally incapable of accommodating such equipment, or may require costly and time consuming make-ready, at a minimum. In addition, many of NextG's Nodes are deployed on street light poles typically in urban locations. Street light and traffic signal poles generally are not designed to hold equipment of the size and weight required to accommodate backup power.

B. Local Government And Resident Opposition

In addition, the deployment of facilities large enough to house backup power units would face significant hurdles from local governments and residents. Local government zoning codes would be a barrier to these deployments. For instance, most local government zoning ordinances allow cities to reject placement of communications equipment in rights of way for discretionary aesthetic reasons, which large backup power boxes (either pole mounted or mounted on the

[10] NextG Petition for Reconsideration, Delsman Declaration at ¶ 6.

[11] NextG Petition For Reconsideration at 10.

ground next to the poles) would almost certainly violate.[12] Other municipalities explicitly prohibit such "street furniture" in the public right of way.

Some Cities have very specific equipment size and weight limitations that would preclude the installation of backup power equipment. For example, the City of New York has adopted regulations that permit equipment boxes that are only 13 inches by 9 inches by 4 inches. The City's regulations will allow an equipment box with a volume of no greater than 2.8 cubic feet, with a maximum width of 18 inches only upon a demonstration of an "operational need" to the City's satisfaction.[13] It would be impossible for NextG, or anyone, to install backup power equipment in the public rights of way within the parameters of the New York City regulations.[14] Experience indicates that the placement of large industrial boxes along roadsides would face significant opposition from local government and residents.

In addition, because of the lead or other chemicals contained in batteries and/or generators, the backup power units raise hazardous material issues, such as CERCLA.[15].

C. Backup Power At Every Node Would Be Cost Prohibitive

Finally, the cost of installing backup power at every DAS Node would be prohibitive. At the time of the Commission's *Katrina* backup power rules, NextG estimated that the costs of pedestal-mounting batteries sufficient to provide eight hour power backup would cost at least

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[12] *See, e.g., Sprint Telephony PCS, L.P. v. County of San Diego* (9th Cir. 2007).

[13] *See, e.g.,* City of New York Department of Information Technology and Telecommunications, Request for Proposals For Franchises For The Installation And Use, On City-Owned Street Light Poles, Traffic Light Poles, Highway Sign Support Poles And Certain Utility Poles Located On City Streets, Of Telecommunications Equipment And Facilities, Including Base Station And Access Point Facilities, In Connection With The Provision Of Mobile Telecommunications Services, § 5(a) (released July 19, 2007).

[14] NextG has also been involved in a multi-year lawsuit with the City regarding the City's barriers to NextG's entry in violation of Section 253 of the Communications Act.

[15] 40 C.F.R. § 302.4; Gould, *Inc. v. A & M Battery & Tire Serv.*, 232 F.3d 162, 167 (3rd Cir. 2000); *Axel Johnson, Inc. v. Carroll Carolina Oil Co., Inc.*, 191 F.3d 409, 411 (4th Cir. 1999).

$25,000 per Node.[16] If the installation were required to be underground, the cost would be significantly higher and more complicated. Imposition of such costs would severely disadvantage NextG, while generally undermining the economic feasibility and attractiveness of DAS.

IV. CONCLUSION

NextG provides this information in response to the NOI to help the Commission evaluate and understand the issues that should prevent the imposition of any backup power rule on DAS Nodes. The deployment of DAS supports multiple public interest goals, including advancing the Commission's goal of facilitating communications service deployments to all Americans and advancing the deployment of new technologies and services to the public.[17] Thwarting DAS deployment with a rigid application of a backup power rule would cause immediate and lasting harm to the many public interest benefits DAS provides.

Respectfully Submitted,

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[16] NextG Petition For Reconsideration, Delsman Declaration at ¶ 14.

[17] 47 U.S.C. § 151; 47 U.S.C. § 157(a) ("It shall be the policy of the United States to encourage the provision of new technologies and services to the public." Further, the notes to Section 157 direct the FCC to take specific action to ensure the deployment of advanced telecommunications capabilities including "removing barriers to infrastructure investment".).